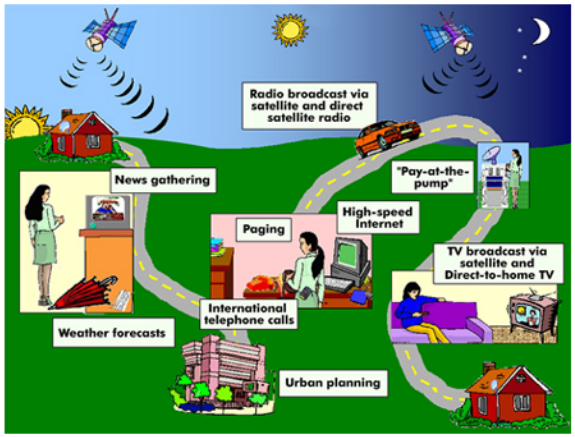
What is commercial space transportation? Why is it important?

How are we able to enjoy live television and radio broadcasts from anywhere in the world? Make international telephone calls? Manage natural resource use? Respond to emergencies and disasters? Satellite technology is the short answer. But how do satellites get to space? This is the function of commercial space transportation.

Space transportation is the movement of, or means of moving objects to, from, or in space. You are probably familiar with at least one form of space transportation: the Space Shuttle. The National Aeronautics and Space Administration (NASA), a U.S. government agency, owns the Space Shuttle and uses it to take astronauts into space.

But the Space Shuttle does not carry the satellites that help us everyday. Commercial space transportation meets these needs. Commercial rockets (also known as "launch vehicles") are built and owned by private companies, not government agencies.



How do commercial launch vehicles get satellites to space?

Rocket engines are the key to getting launch vehicles and their cargoes into space. Rocket engines work because of a principle called "propulsion." In the engine, rocket fuel burns and forms gases. The gases push in all directions, but a nozzle at one end of the engine allows the gases to escape in only one direction. This creates a force on the rocket, much like the one you feel when spraying water from a garden hose. The force is great enough to lift the rocket off the ground–and into space!

Launch vehicles have to work hard fighting gravity in their upward climb. To do this, they carry a lot of fuel, which makes them even heavier. In order to reduce the weight they carry into space, vehicles are often built of multiple sections, or "stages." Each stage has its own fuel. When all of a stage's fuel is burned, the vehicle drops the stage so it does not have to carry extra weight.

Other important technologies for commercial launches are systems that track, guide, and control launch vehicles as well as launch pads and control centers.

Are there different types of launch vehicles?

Launch vehicles range in size. Bigger satellites and those bound for high orbits generally need bigger rockets than smaller and lower-orbit satellites. Satellite owners have many launch options because several countries build launch vehicles. In the United States, there are multiple launch companies.

The commercial launch vehicles used today are called "expendables" because their stages are not recovered for re-use. In the future, satellites and even people may ride on "reusable" vehicles, which would return to Earth after their missions and be used again.

How big a business is commercial space transportation?

In 1999, U.S. commercial space launches and the satellites they put into space added over $60 billion to the U.S. economy. That level will likely grow in the future as people think of new ways to use the unique environment of space.

How should I prepare for a career in space transportation?

Want to be part of the team that designs and builds launch vehicles in the future? The success of the space transportation industry depends on the hard work and cooperation of engineers, scientists, technicians, businesspeople, lawyers, accountants, and other creative and talented people. You can begin preparing for a career in space transportation by taking a broad range of classes in high school, including English, math, science, foreign language, social studies, and appropriate electives.

Choosing a college major depends on what role you want to have in the industry. Want to be a rocket scientist? Then you'll want to consider engineering fields, math, physics, and chemistry. Want to help a company sell launch vehicles? A business-related major would be ideal for you.

During your college career, find out about career opportunities by contacting companies and government organizations involved in space transportation. An Internet search for the keywords "space transportation" or "aerospace" should help you locate these organizations.

With space transportation, not even the sky's the limit on your career opportunities!

About the Associate Administrator for Commercial Space Transportation

The Associate Administrator for Commercial Space Transportation (AST) is the only space-related office in the Federal Aviation Administration (FAA). AST is the U.S. government agency responsible for regulating rocket launches and reentries conducted by private companies in the United States. AST's mission is to make sure their activities do not harm public interests, including safety of the public and property as well as U.S. national security and foreign policy interests. AST also works to encourage, facilitate, and promote U.S. commercial space transportation.

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